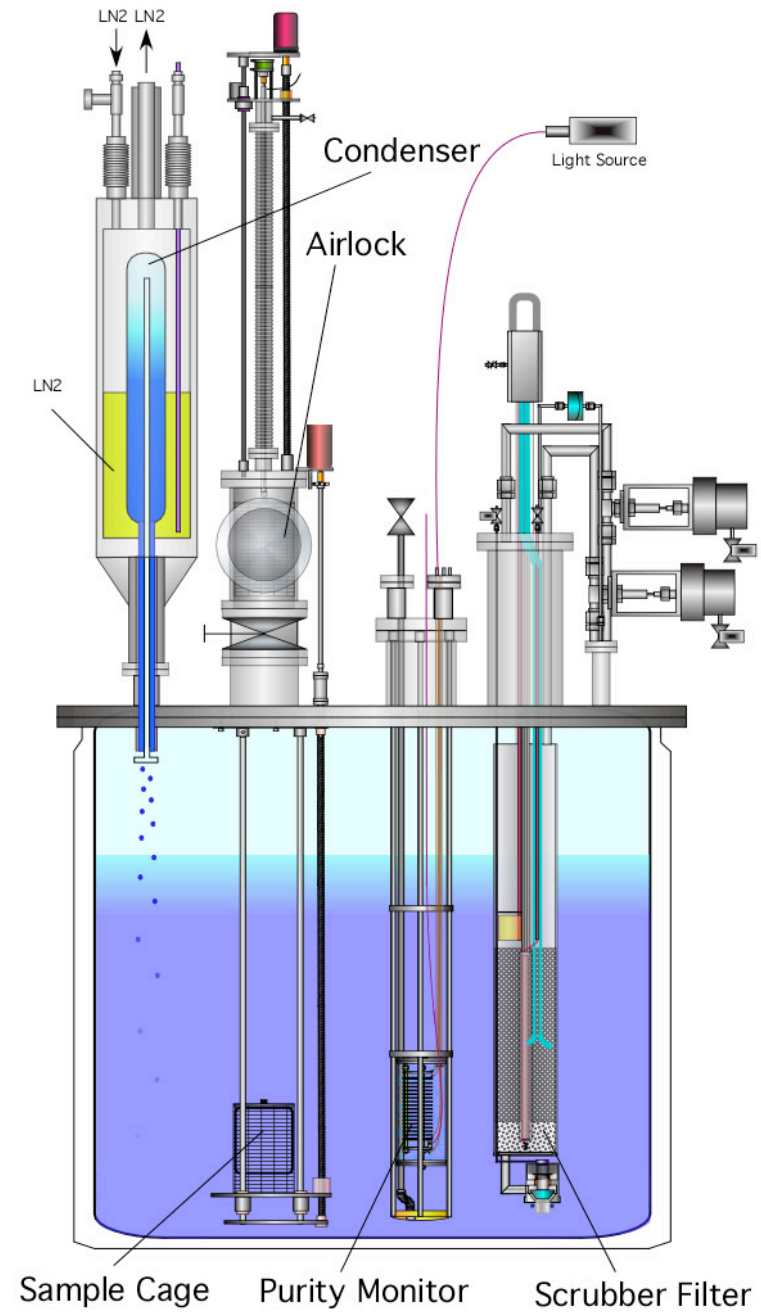
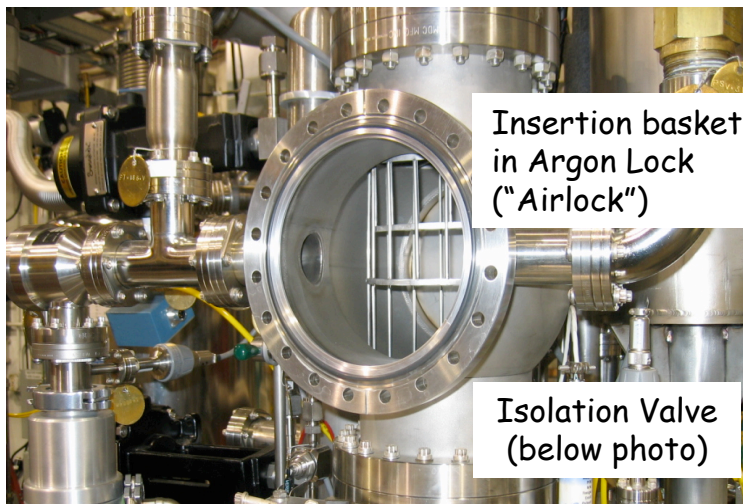


Materials Test System.

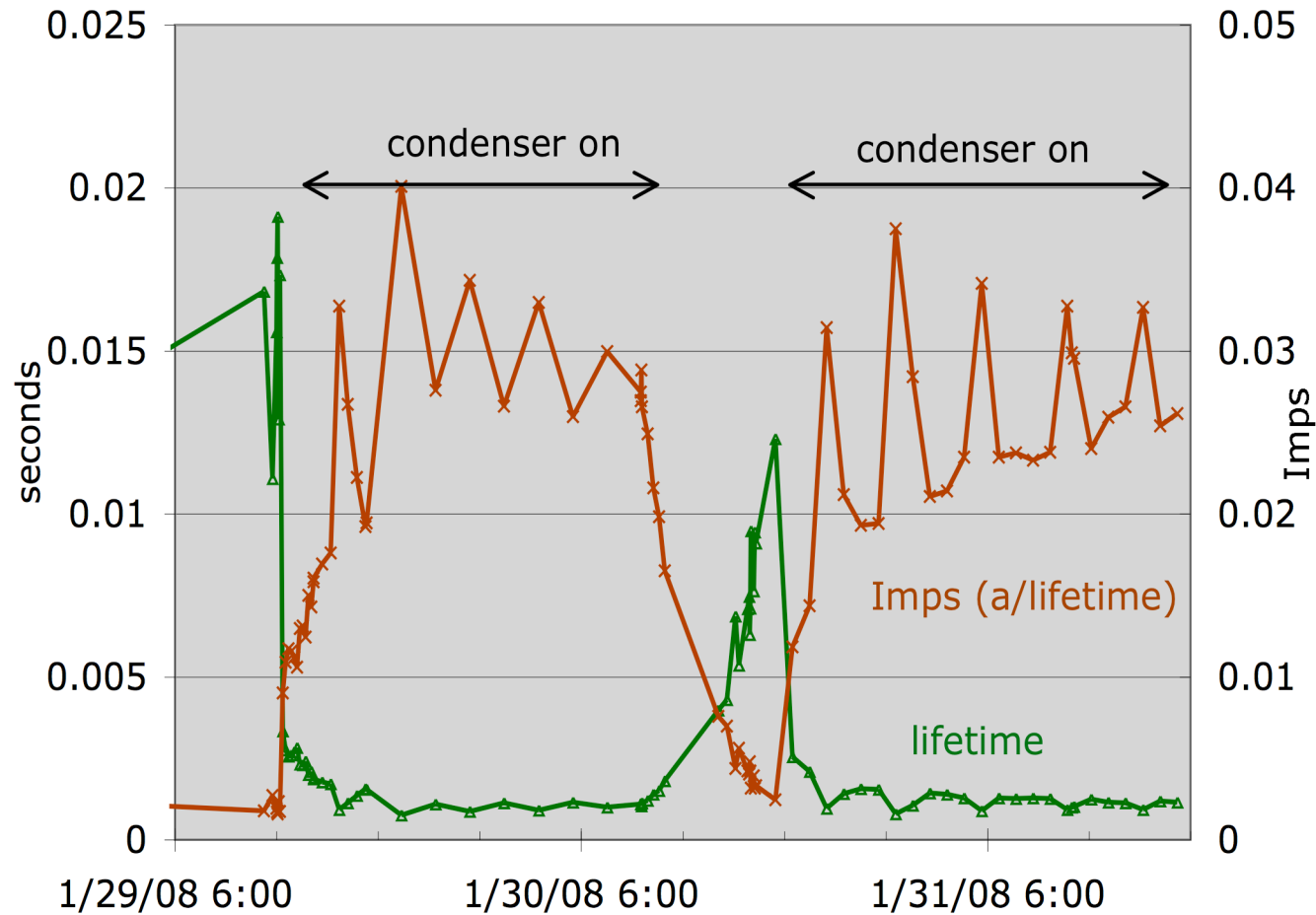
Features:

- the condenser
(to maintain a closed system)
- the sample insertion mechanism
(allows insertion of materials without evacuation)
- the lifetime monitor (PrM)
(to measure the electron drift-lifetime)
- the filter pump
(filled with zeolite and oxygen-filter material)



Raining condensers may be a problem

Effect of Condenser Operation on Lifetime



Cure for condenser effect:

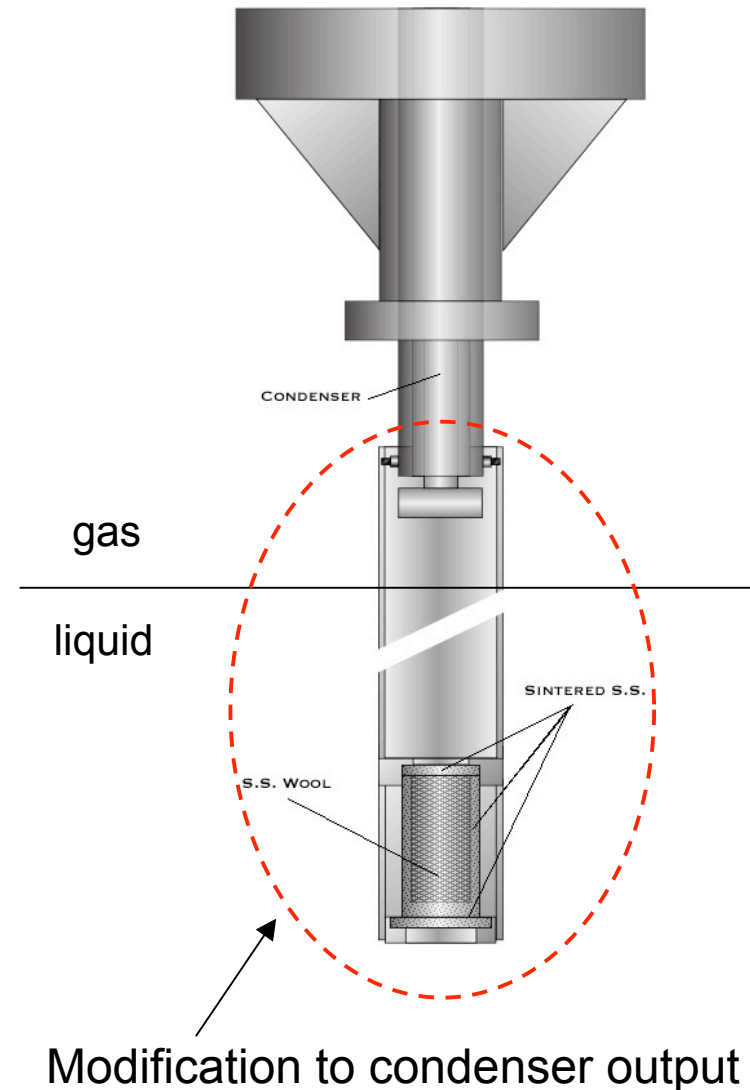
Effect (believed to be) caused by Argon ions developed as liquid drips from bottom of condenser through Argon gas onto liquid surface.

Extended condenser return into liquid by adding pipe with sintered SS and SS wool to discharge ions.

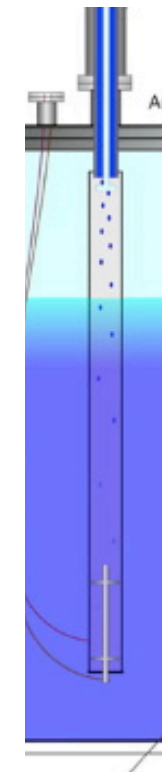
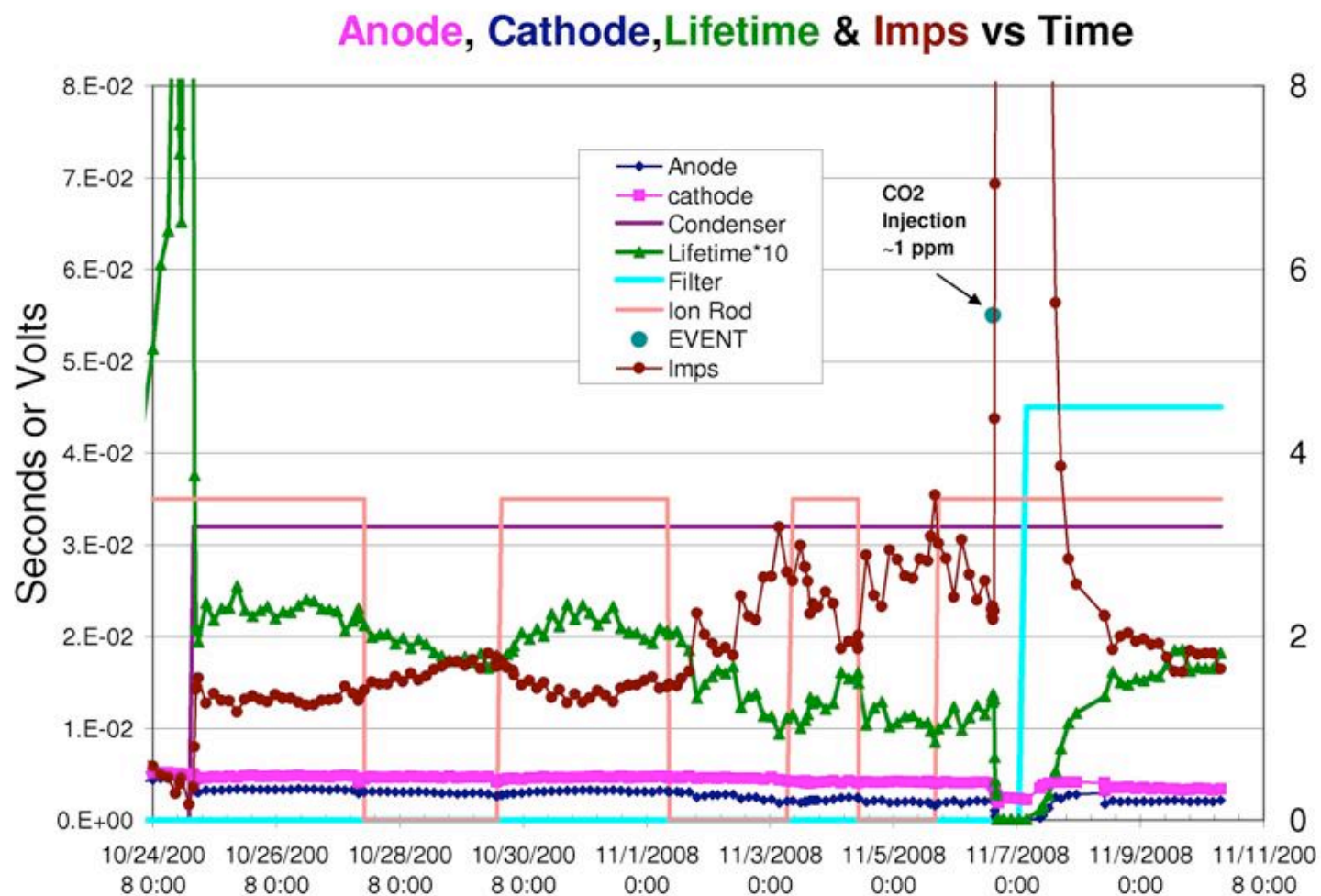
Effect largely eliminated but the sinter clogged up.

Will try to verify explanation by replacing pipe and SS material with a rod at some voltage to attract ions directly.

Significant for design of large tanks where we are considering N2 condenser coils in the ullage



Effect of voltage gradient (1/2" rod, 2" tube, 1300 Volts)



Ion Rod & Tube
(Tube -ve,
Rod at Cryostat
Ground)

Next R & D step:
Install a carousel below condenser
output:

- a simple hole:
- a tube with a sintered metal end that can be above or below the liquid:
- a tube as above with a sintered glass end:
- a grounded funnel with a spiral line into the liquid so that the drops from the condenser hit metal before entering the bulk liquid.



Recommend that base-line MicroBooNE use an external cooling system that does not rain